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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|----------------------|------------------|
| 09/752,642 | 12/29/2000 | Peter Lynton Flake | PA1447US | 1487 |
| 36503 | 7590 | 09/22/2004 | EXAMINER | |
| SYNOPSYS, INC. C/O PARK, VAUGHAN & FLEMING LLP 508 SECOND ST., SUITE 201 DAVIS, CA 95616 | | | HARTMAN JR, RONALD D | |
| | | ART UNIT | PAPER NUMBER | |
| | | 2121 | | |

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|----------------------|--------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/752,642 | FLAKE ET AL. |
| | Examiner | Art Unit |
| | Ronald D Hartman Jr. | 2121 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 02 July 2004.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 26-49 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 26-49 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____.

DETAILED ACTION

1. Via the Amendment, filed on 7/2/2004, claims 1-25 are canceled and claims 26-49 are newly added. Therefore an action appears below on the merits of claims 26-49 and this action is made **FINAL**.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 39-50 have been renumbered as claims 38-49, respectively and the dependencies of claims depending on the renumbered claims have been renumbered as well.

Claims 29, 37 and 45 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

As per claims 29, 37 and 45, claims 28, 36 and 44, respectively, already adequately sets forth that the wrapper being used as a communication mechanism since pending claims 28, 36 and 44 claim the wrapper being used for allowing code in HDL (hardware description language) to call code, which is a communications mechanism, in the computer programming language and therefore all of the limitations and or features claimed by way of pending claims 29, 37 and 45 have already been adequately set forth by way of pending claims 28, 36 and 44, respectively.

Claims 32, 40 and 48 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

As per claims 32, 40 and 48, the combination of claims 28 and 31, 36 and 39 & 44 and 47, respectively, already adequately sets forth that the wrapper is used for calling external functions (claims 28, 36 and 44) and that the wrapper provides for automatic threading (claims 31, 39 and 47) and therefore all of the limitations and or features claimed by way of pending claims 32, 40 and 48, this feature being specifically that the automatic threading enables code to call other code are features and or limitations that have already been adequately set forth and claimed by way of the combination of pending claims 28 and 31, 36 and 39 & 44 and 47, respectively.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 26, 34 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by Steinmetz Jr., U.S. Patent No. 5,600,579.

As per claims 26, 34 and 42, Steinmetz Jr. teaches a method comprising:

- receiving a description of a digital circuit, wherein a first portion of the description is in a hardware description language and a second portion of the description is in a computer programming language (i.e. using a combination of HDL and Verilog's programming language interface, C1 L32-42); and
- blending the first portion and the second portion into an executable simulation and executing the simulation, wherein the simulation allows a designer to simulate the operation of the circuit (i.e. Figure 1 element 101 and Abstract).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 27-33, 35-41 and 43-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steinmetz Jr., as applied to claims 26, 34 and 42 above, in view of Hellestrand et al., U.S. Patent No. 6,230,114.

As per claims 27, 35 and 43, Steinmetz Jr. does not specifically teach mapping data from the hardware description language into data in the computer programming language.

Hellestrand et al. teaches mapping data types in a hardware description language into data types of a computer programming language (i.e. using the mapper and translator, Figure 1 elements 145 and 147; C9 L35-47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Hellestrand et al into the teachings of Steinmetz Jr. since the inventions are related to analogous art in that they are both directed towards utilizing higher programming languages, in conjunction with a hardware description language, to simulate the hardware operation of a digital circuit. Therefore, since the two different languages obviously require a way by which they can effectively communicate through and with one another, the Hellestrand reference is applied to show this explicitly, and the inclusion of these features into Steinmetz Jr. would have been obvious to one of ordinary skill in the art at the time the invention was made for the purpose of allowing for external functions of a higher programming language to be called so that their functions may be utilized during the simulation process which forms a more powerful simulation environment since the system is no

longer restricted by the use of one programming language, namely, the hardware description language.

As per claims 28-29, 32, 36-37, 40, 44-45 and 48, Steinmetz Jr. teaches creating a wrapper for code written in the computer programming language so that code written in the hardware description language can call code written in the computer programming language (i.e. C2 L5-11, C5 L47-C6 L8, C7 L16-31 and C22 L53-62).

As per claims 30, 38 and 46, a wrapper being automatically generated is a feature that is inherent to the disclosed functions and or capabilities of Steinmetz Jr.'s claimed invention since the compilation of the two different code, representing two different languages, occurs via software, and therefore automatically generating the wrapper is a feature that is contemplated by Steinmetz since clearly the system of Steinmetz automatically creates a wrapper for the languages when a simulation is schedules to occur.

As per claims 31-32, 39-40 and 47-48, Steinmetz Jr. does not specifically teach the use of automatic threading, however, in view of Microsoft Press's Computer Dictionary, having a publish year of 1997, the term "thread" is interpreted by the examiner to mean "In programming, a process that is part of a larger process or program" and since this concept is inherent to the teachings of Steinmetz Jr. since clearly when a function call is made utilizing the system of Steinmetz, a process thread inherently occurs in conjunction with the actual call and subsequent return form the call.

As per claims 33, 41 and 49, the use of a message upon occurrence of a call and a return is a feature that is obvious over the combined system of Steinmetz Jr. (Steinmetz in view of Hellestrand et al.) since there obviously is some type of messaging means to allow the HDL program to know whether an external call to the other programming language (i.e. C++) has taken place correctly, thereby giving the combined system of Steinmetz Jr. the ability to effectively diagnose problems or errors

effectively and quickly, and this would have been obvious to one of ordinary skill in the art at the time the invention was made.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald D Hartman Jr. whose telephone number is 703-308-7001, and after October 12, 2004, (571) 272 - 3684. The examiner can normally be reached on Mon. - Fri., 11:30 am - 8:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 703-308-3179, and starting October 12, 2004, at (571) 272 - 3687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ronald D Hartman Jr.
Examiner
Art Unit 2121



Anthony Knight
Supervisory Patent Examiner
Group 3600